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# Power handling using buck boost converter

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**Abstract:** The important reason for this project is to establish the major drawbacks of E- waste the level of silicon material is very low and so we don't have any alternation methods, at least we may reduce the usage of silicon by using Multi Work using Single Module (MWSM) Using one charger to charge multiple electronic devices is preferable to using multiple chargers in order to reduce the level of production of large amounts in chargers. This charger basically operates on the principle of DC-to-DC charge with continuous flow and will also function as a power bank for smaller electronics. The electronics in all over the world is basically work under the progress of simple incrementation in amp and major difference in the voltage level.

**Key Word:** MWSM, Continuous flow, electronic device, DC-DC charge, Lithium-ion cells, Power Bank, Amp amplification.

## 1. Introduction

The safe way of charging and high-speed charging is done in dc-dc charging so the power supply is storing in the battery and then that energy source will act as a major source depend on the load level electronics it will slightly differs. The lithium-ion cells of 18650 are used; four of these cells are connected in series to function as a power bank for the charger. Each 18650 cell has a 3.7V and 2000mah capacity, which can charge two mobile phones for small continuity.

## 2. Material And Methods

The major problem of carrying lot of chargers and spent lot of money to buy the new charger for each and every electronics, Approximately a 22watt charger cost up to 1500 Rs , lot of laptop chargers consist up to 4000 Rs and some of the electric vehicle chargers are in makes lot of problems for six months so to buy a new charger it cost up to 5000 – 10000 rupees
To rectify this problem we introducing the universal charger which is also called as all in one charger which mean the one charger with high quality and high performance capable to act as mono electronics charger in the world For first time the amount of voltage and ampere is manually control for the output.
In the future the manual control will developed into automatic format which mean the manual adjustment of voltage and ampere will automatically converts depend upon the electronics which is plugged in to our universal charger.
The dimensions of the charger is 160*180.

**SAMPLE SIZE CALCULATION:** A buck-boost converter with an input voltage range of 9V to 24V, an output voltage of 12V, and a maximum output current of 5A, the maximum output power would be

$$Pout = \eta * Pin$$
$$Pout = 0.9 * 24V * 5A$$
$$Pout = 108W$$

**Subjects & selection method**: The design and implementation of a buck-boost converter require expertise in power electronics, control systems, and circuit design. The converter must be designed to handle the desired power level while minimizing losses and ensuring efficiency. The control system must be designed to maintain stable output voltage and current under varying load conditions.

In conclusion, power handling using a buck-boost converter is a crucial aspect of power electronics and has a significant impact on various industries and applications. The design and implementation of a buck-boost converter require expertise and careful consideration to ensure optimal performance and efficiency.

**Procedure methodology**

By the above diagram we get the feedback power supply and make it work in the current value (2) point will make the contact with ground extra leak current to flow through the switch (4) this line is set to connect with other purpose to adjust the

current[4] .

The above diagram is explain about the blocks of buck boost converter that we uses in our project[6].

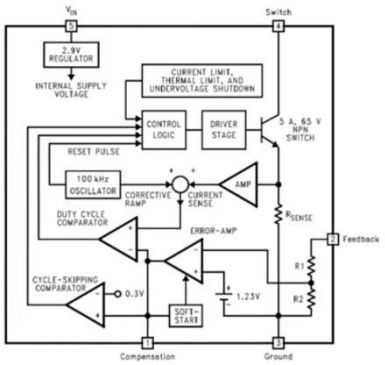


*Figure 1: Buck boost converter*

But using the buck boost converter we can maintain the voltage level only we cannot able to change the current value so to improve the ampere [27] we just add another circuit which is capable of maintaining the current values by potentiometer.

**Statistical analysis**

**Table 1: Total power analysis**

| SI.NO: | TOTAL POWER ANALYSIS | | |
|---|---|---|---|
| | POTENTIOMETER LEVEL ADJUST | VOLT | AMP |
| 1) | 2.2 K | 15V | 1amp |
| 2) | 4.7 K | 20V | 1.5amp |
| 3) | 6.8K | 28V | 2amp |
| 4) | 9.2K | 36V | 2.5amp |

So, in this case, the buck-boost converter can handle a maximum output power [2] of 108W. However, the actual power handling capability may be lower due to factors such as temperature, voltage ripple, and other design considerations.

Buck-boost converters are used in power supplies for electronic devices, battery chargers, electric vehicles, and renewable energy systems. They are also used in industries such as aerospace, automotive, and telecommunications.

The design and implementation of a buck-boost converter require expertise in power electronics, control systems, and circuit design. The converter must be designed to handle the desired power level while minimizing losses and ensuring efficiency. The control system must be designed to maintain stable output voltage and current under varying load conditions.

In conclusion, power handling using a buck-boost converter is a crucial aspect of power electronics and has a significant impact on various industries and applications. The design and implementation of a buck-boost converter require expertise and careful consideration to ensure optimal performance and efficiency.

## 3. Result

Output voltage: The output voltage is the voltage that is delivered to the load. The buck-boost converter can be used to regulate the output voltage to a desired level.

Output current: The output current is the current that is delivered to the load. The maximum output current of the converter determines the maximum amount of power that can be delivered to the load [5].

Efficiency: The efficiency of the buck-boost converter is the ratio of the output power to the input power. Higher efficiency means less power is lost as heat and more power is delivered to the load.

To calculate the power handling capability of a buck-boost converter, you need to consider these factors and use the following formula:

$P_{out} = \eta * P_{in}$

Where Pout is the output power, Pin is the input power, and η is the efficiency of the buck-boost converter.

## 4. Conclusion

In the modern world with the development of big innovations also we are using multiple charger to charge our electronics and it takes lot of spaces and the cost for each and every one the major problem is e-waste lot of e waste due to chargers Globally, **54,000 metric tons** of chargers are wasted each year, according to Kuehr. That's only about 0.1 percent of the total 53.6 million metric tons of e-waste generated annually, according to the 2020 Global E-Waste Monitor that Kuehr co-authored. We can rectify this by the help of single charger.

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